access control element according to the priority of the type of each access control specifier, one or more characteristics of a packet are matched with the access control specifiers, one of the matches is selected according to the access control specifier with the highest associated priority, and the selected packet is processed. Types of access control specifiers correspond to the information in an access control entry. In one aspect of the present invention, an access control element is a content addressable memory. In another aspect of the present invention, the matching and processing are performed in parallel. In a further aspect of the present invention, the characteristics of the packet include one or more of a source address, a destination address, a source port, a destination port, a protocol type, an input interface and an output interface. In another aspect of the present invention, one or more of the access control specifiers are identified based on the matching and the identified access control specifiers are prioritized based on the matching.

The present invention further provides a system for processing a packet. The system includes one or more access control specifiers, an access control element, and a priority encoder. The access control specifiers are have a plurality of types and those types are related to information in an access control entry. The access control element is configured to store the access control specifiers according to the priority of each access control specifier and to match one or more characteristics of a packet with the access control specifiers. The priority encoder is configured to select the highest priority match from among the matches. In one aspect of the present invention, the access control specifier further includes a label match mask for determining whether a first bit of the packet characteristics is tested and a label match pattern for comparing to a second bit of the packet characteristics. In another aspect of the present invention, a processor is coupled to the access control element to process a packet not otherwise processed by the access control element.

The present invention also provides a system for processing a packet that includes a means for configuring a plurality of access control specifiers in an access control element according to a priority of a type of each access control specifier, a means for matching one or more characteristics of the packet with one or more of the access control specifiers, and a means for processing the packet based on the matching.

The present invention further provides a system that includes a means for maintaining a set of access control patterns, means for receiving a packet label responsible to a packet, means for matching matchable information responsive to the packet and the access control patterns, means for generating a set of matches in response to the means for matching, means for selecting at least one of the matches in response to priority information in the set of matches and generating an access result in response thereto, and a means for making a routing decision based on the access result.

The present invention also provides a method for processing a packet that includes selecting an output interface to which to forward the packet, determining forwarding permission for the packet by matching one or more characteristics of the packet with one or more access control specifiers, and processing the packet based on the forwarding permission, wherein the selecting and the determining are performed in parallel.